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10/523,591	02/01/2006	Robert Rathmann	BOE01 062	5810

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EXAMINER	
SEMENENKO, YURIY	

ART UNIT	PAPER NUMBER
2841	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,591	RATHMANN, ROBERT	
	Examiner	Art Unit	
	Yuriy Semenenko	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6 and 8-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8* is/are allowed.

6)☒ Claim(s) *1-4,6 and 8-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/02/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendment filed on 10/02/2007 has been entered.

In response to the Office Action dated 07/02/2007, Applicants have amended claims 1-4, 6 and 8-14.

Claims 5 and 7 have been cancelled.

Claims 1-4, 6, 8-14 are now pending in the application.

Claim

2. Claims 1-14 amendments, filed on 10/02/2007 are considered and acknowledged. The claims amendments are approved.

Claim Objections

3.1. Claim 6 is treated herein as depending from claim 1, since claim 5 has been cancelled.

3.2. Claims 1-4, 6, 8-14 are objected to because of the following informalities: claims should not contain reference number and parentheses.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4.1. Claims 1-4, 6, 9, 10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda (US 6501662) and in view of Linden et al. (Patent #6201701) [hereinafter Linden] and in view of Grauvogel (Patent #DE-19730865).

As to claim 1: Ikeda discloses in Fig. 3 an arrangement 1 to accommodate the power and control electronics of an electric motor 3b, Fig.1, comprising: a first circuit board 30, Fig. 3 mounted with control electronic components 51,52, 53; a second circuit board 41,42 mounted with power electronic components 11a to 11f which has a substrate that not only has electrically insulating properties but also good thermal conductivity (column 6-10); and a cooling element (21 with side wall of the box 20) in thermally conductive contact with the substrate of the second circuit board 40, wherein the first circuit board 30, Fig. 3 is arranged spaced apart from the second circuit board 40, wherein the substrate layer of the first circuit board 30, is covered with layers on two sides and that the tracks formed on the lower layer are connected to the power electronic components 11a to 11f , Fig. 3 on the topside of the second circuit board 40 located opposite,

except, Ikeda doesn't teach two things:

1. substrate layer made of electrically insulating plastic; and
2. the first circuit board has a copper layer.

Grauvogel discloses the base layer is made of a plastic (Abstract).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to make the substrate layer disclosed by Ikeda from electrically insulating plastic, as taught by Grauvogel, in order to provide heat dissipation.

Linden discloses conductive layer 46, Fig. 3 is a copper layer (column 8, lines 9-10).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to make the first circuit board disclosed by Ikeda with a copper layer, as taught by Linden, in order to provide better electrical conductivity.

As to claim 2: Ikeda as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 1, wherein the second circuit board has a three-layer construction with conductive layer 41, Fig. 3, a base layer in contact with the conductive layer 41 made of a material that has good electrically insulating properties and good thermal conductivity (column 6-10) and a metal layer 42 made of a metal which conducts heat well and is connected to the base layer in a thermally conductive way, and that the metal layer is in thermal conductive contact with the cooling element 21,

except, Ikeda doesn't explicitly teach that conductive layer is a copper layer.

Linden discloses conductive layer 46, Fig. 3 is a copper layer (column 8, lines 9-100.

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to make the conductive layer disclosed by Ikeda with a copper layer, as taught by Linden, in order to provide better electrical conductivity.

As to claim 3: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 2, wherein the metal layer 42, Fig. 3 is made of aluminum or an aluminum alloy (column 4, lines 6-11),

except, Ikeda doesn't explicitly teach the base layer is made of a ceramic material having high thermal conductivity and good dielectric insulating properties

Grauvogel discloses the base layer is made of a ceramic material (Abstract).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to make the base layer disclosed by Ikeda is from a ceramic material having high thermal conductivity and good dielectric insulating properties, as taught by Grauvogel, in order to provide heat dissipation.

As to claim 4: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 2, wherein the cooling element 21, Fig. 3 has a heat sink 21, Fig. 3 which is in extensive surface contact with the metal layer 42 in a thermally conductive way and is made of metal, preferably of aluminum (column 4, lines 6-11).

As to claim 6: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 1, wherein the first circuit board 30, Fig. 3 is arranged above and essentially parallel to the second circuit board 40,

As to claim 9: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 4, wherein the first circuit board 30, Fig. 4 is supported directly on the heat sink 21 by means of spacers 64.

As to claim 10: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 4, wherein the first circuit board 30, Fig. 3 is directly supported on a wall of the heat sink, bracing means 62,61 for the circuit board 30 being provided on the wall of the heat sink .

As to claims 12 and 13: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 4, wherein the heat sink 21,

Fig. 3 has cooling fins and that air can flow through the spaces between the cooling fins; and wherein the heat sink 21 is made of aluminum or an aluminum alloy (column 3, lines 39-40).

4.2. Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda in view of Linden and in view of Grauvogel, as applied to claims 1-4, 6, 9, 10, 12 and 13 above, and further in view of Oka et al. (Patent #DE19636723) hereinafter Oka.

As to claim 11: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 4, wherein the heat sink 21 has an accommodating space (space between the sink 21 and the cover 20) for the first 30 and the second 40 circuit board including the components located on them,

except, Ikeda doesn't teach the heat sink is connected via a surrounding flange to a counter flange of the motor housing.

Oka teaches in Fig. 4 the heat sink 301a is connected via a surrounding flange 106to a counter flange of the motor housing 100 (Abstract).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include in Ikeda that the heat sink disclosed by Ikeda is connected via a surrounding flange to a counter flange of the motor housing, as taught by Oka, in order to provide heat dissipation.

As to claim 14: Ikeda, as modified, discloses the arrangement having all of the claimed features as discussed above with respect claim 1,

except, Ikeda doesn't teach a motor housing connected to the cooling element.

Oka teaches in Fig. 4 the heat sink 301a is connected to the motor housing 100 (Abstract).

Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include in Ikeda that a motor housing disclosed by

Ikeda connected to the cooling element, as taught by Oka in order to provide heat dissipation.

Allowed Claims

5. Claim 8 is allowed.

The following is a statement of reasons for the indication of allowance claim 8: Limitations "at least one power electronic housing of the power electronic component is soldered onto the second circuit board and comprises connecting pins which are soldered to the first circuit board mounted with the control components" in combination with other claimed limitations in independent claim 1 are not disclosed or suggested by the prior art of record.

Response to Arguments

6. Applicant's arguments filed 10/02/2007 have been considered but are moot in view of the new grounds of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutiérrez can be reached on (571)- 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YS

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